

REMARKS

By the present amendment, independent claims 1 and 17 have been amended to include features previously recited in dependent claim 4, which is canceled herein, noting that in view of the position set forth by the Examiner, the claims have been amended to utilize “means for” or “step for” language, although the Examiner’s position is considered improper. Additionally, new dependent claims 19 and 20 have been presented. The specification has been amended to include reference numerals 1, 3 and 6 to properly describe the elements shown in Fig. 3a. Accordingly, correcting drawings are considered unnecessary, and the drawing objection should be overcome. No new matter has been entered.

At the outset, applicants submit that the present invention is directed to an ultrasound a transparency control means 3A, shown in Figure 2, for example, to control the degree of the transparency of a color Doppler image of a transparent display. As described on, page 7, paragraph [0014], page 11, paragraph [0023] and page 13, paragraph [0025] of the specification, the transparency control means 3A appropriately controls a transparency color bar 54 which is reduced in transparency with an increase in variance of flow velocities. The transparency of three dimensional voxels is decided based on the variance using the transparency color bar 54. As a result, as shown in FIG. 5, a blood flow having a small variance is increased in transparency, and a blood flow having a large variance is reduced in transparency (increased in opaqueness), so that turbulence is emphasized in the displayed three dimensional color Doppler projection image 55. This transparency control is not disclosed in any of the cited references, as will become from the following discussion.

As to the rejection of claims 1-8 and 11-18 under 35 USC 103(a) as being unpatentable over Izatt et al (USPN 6,735,463 B2) in view of Seo (Re 35371) and the rejection of claims 9 and 10 under 35 USC 103(a) as being unpatentable over Izatt '463 in view of Seo '371, and further in view of Shiki (USPN 7,044,913 B2), such rejections are traversed insofar as they are applicable to the claims, as amended, and reconsideration and withdrawal of the rejections are respectfully requested.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Amended claims 1 and 17 and the claims that depend therefrom patentably distinguish over cited art in the sense of 35 U.S.C. 103 (a) and should be considered allowable thereover. At the outset, as recognized the Examiner, Izatt et al does not disclose ultrasound diagnostic apparatus comprising transmitting/receiving an ultrasound wave to/from an examinee via an ultrasound probe. While ultrasound technology was available to Izatt et al at the time of the Izatt et al invention, it is apparent that Izatt et al specifically chose to use optical transmission and detection in lieu of ultrasound. Therefore, the combination of ultrasound as taught by Seo with Izatt et al is considered to be a hindsight reconstruction attempt and improper.

The Examiner further states that Izatt et al teaches an image processing means that causes the color Doppler image to be displayed transparently in element 56 of figure 1, element 176 of figure 13, and column 4 lines 9 – 24. However, element 56 of figure 1 is simply a digital signal processor ("DSP") that generates a gray scale image 58, velocity array 72, and a color velocity image processed and combined with or overlaid onto a gray scale image 58 as disclosed in column 8, lines

30 – 40 and column 11, line 62 – column 12 line 2. Element 176 of figure 13 is a display for displaying an optical coherence tomography (“OCT”) image as disclosed in column 20, lines 46 – 59. In column 4, lines 6 – 24, Izatt et al discloses that desired velocities are displayed based on a velocity display color scale corresponding to user specified threshold velocities. Velocities which are smaller than the threshold velocities are rendered as transparent to indicate that flow was not detected in that image region, such that the color Doppler image is not visualized and only the gray scale image is visualized on that region. Contrary to the features of the present invention, such a threshold velocity applied to the color scale in Izatt et al has only a function to control on/off of displaying the color Doppler image, not to control a degree of the transparency of the color Doppler image, as previously recited in dependent claim 4 and now recited in independent claims 1 and 17. There is no disclosure or suggestion in Izatt et al of controlling the degree of the transparency of the color Doppler image, and applicants submit that independent claims 1 and 17, and therefore dependent claims 2, 3, 5-16 and 18, patentably distinguish over Izatt et al in the sense of 35 USC 103 and all claims should be considered allowable thereover.

With respect to the dependent claims, applicants note that claims 5 - 8, for example, recite further features of the transparency control not disclosed by Izatt et al.

The Examiner uses the secondary reference of Seo, which teaches the use of ultrasound in blood flow detection in col. 2 lines 47 – 49 to make up for the deficient disclosure of Izatt et al regarding the use of an ultrasound diagnostic apparatus to form a tomogram image by transmitting/receiving an ultrasound wave via an ultrasound probe. While not acquiescing to the propriety of the Examiner’s


combination of Seo to make up for the Examiner's recognized deficiencies of Izatt et al, applicants submit that there is no disclosure or suggestion in Seo concerning controlling the degree of the transparency of the color Doppler image, as recited in the independent and dependent claims. Therefore, neither Izatt et al nor Seo taken singly or in combination, disclose or teach all the features recited in the present claims, and all claims should be considered allowable thereover.

In view of the above amendments and remarks, applicants submit that all claims present in this application should now be in condition for allowance and issuance of an action of favorable nature is courteously solicited.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 529.45793X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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